

Attachment 1

**UNITED STATES INTERNATIONAL TRADE COMMISSION
WASHINGTON, D.C.**

In the Matter of

**CERTAIN WIRELESS
COMMUNICATIONS EQUIPMENT AND
COMPONENTS THEREOF**

Investigation No. 337-TA-_____

**COMPLAINT UNDER SECTION 337
OF THE TARIFF ACT OF 1930, AS AMENDED**

COMPLAINANTS

Samsung Electronics Co., Ltd.
129 Samsung ro (Maetan-dong)
Yeongtong-gu Suwon-si
Gyeonggi-do 16677 Korea
Telephone: 82 2 2255 0114

Samsung Electronics America, Inc.
85 Challenger Road
Ridgefield Park, NJ 07660
Telephone: (201) 229-4000

COUNSEL FOR COMPLAINANTS

Paul F. Brinkman, P.C.
Edward C. Donovan, P.C.
F. Christopher Mizzo, P.C.
KIRKLAND & ELLIS LLP
1301 Pennsylvania Ave, N.W.
Washington, D.C. 20004
Telephone: (202) 389-5000
Facsimile: (202) 389-5200
paul.brinkman@kirkland.com

Gregory A. Arovas, P.C.
Todd M. Friedman, P.C.
KIRKLAND & ELLIS LLP
601 Lexington Avenue
New York, N.Y. 10022
Telephone: (212) 446-4800
Facsimile: (212) 446-4900

PROPOSED RESPONDENTS

Ericsson AB
Torshamnsgatan 23
Kista, 16480 Stockholm, Sweden
Telephone: 011 46 719 0000

Telefonaktiebolaget LM Ericsson
Torshamnsgatan 21
Kista, Stockholm, Sweden
Telephone: 011 46 8 710 0000

Ericsson Inc.
6300 Legacy Drive
Plano, TX 75024
Telephone: (972) 583-0000

Kevin Hardy
QUINN EMANUEL
URQUHART & SULLIVAN, LLP
1300 I Street N.W.
Suite 900
Washington, D.C. 20005
Telephone: (202) 538-8000
Facsimile: (202) 538-8100
kevinhardy@quinnemanuel.com

Thomas D. Pease
QUINN EMANUEL
URQUHART & SULLIVAN, LLP
51 Madison Ave., 22nd Floor
New York, NY 10010
Telephone: (212) 849-7000
Facsimile: (212) 849-7100

Paul Zeineddin
AXINN, VELTROP & HARKRIDER LLP
950 F. Street, N.W.
Washington, DC 20004
Telephone: (202) 912-4700
Facsimile: (202) 912-4701
pzeineddin@axinn.com

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EXHIBITS

Exhibits	Description
1	Certified Copy of U.S. Patent No. 9,521,616
2	Certified Copy of U.S. Patent No. 10,797,405
3	Copy of U.S. Patent No. 9,041,074
4	Certified Copy of U.S. Patent No. 9,736,772
5	Copy of Assignment of U.S. Patent No. 9,521,616
6	Certified Copy of Assignment of U.S. Patent No. 10,797,405
7	Copy of Assignment of U.S. Patent No. 9,041,074
8	Copy of Assignment of U.S. Patent No. 9,736,772
9	List of Foreign Counterparts to the Asserted Patents
10	CONFIDENTIAL List of Licensees to the Asserted Patents
11	CONFIDENTIAL Infringement claim charts for U.S. Patent No. 9,521,616
12	CONFIDENTIAL Infringement claim charts for U.S. Patent No. 10,797,405
13	CONFIDENTIAL Infringement claim charts for U.S. Patent No. 9,041,074
14	CONFIDENTIAL Infringement claim charts for U.S. Patent No. 9,736,772
15	PIERS Report
16	Ericsson E.D. Tex. Complaint
17	CONFIDENTIAL Declaration of Alok Shah
18	Samsung 2019 Annual Report
19	CONFIDENTIAL Samsung AT1K04(4T4R AU) Specifications
20	“Experience the Promise of 5G with Samsung’s 5G mmWave solutions,” Samsung
21	Street Macro 6701 B261 Internal Photos
22	Zynq UltraScale+ RFSoc Data Sheet, Xilinx
23	Ericsson 2019 Annual Report
24	“122 Commercial 5G Agreements or Contracts with Unique Operators,” Ericsson.com
25	“AT&T Makes World’s First Standards-Based Mobile 5G Millimeter Wave Connection,” AT&T (Sept. 10, 2018)
26	“Verizon awards 5G contract to Ericsson,” Ericsson (Dec. 11, 2017)
27	“Ericsson leads Sprint’s commercial mobile 5G launch,” Ericsson (May 30, 2019)
28	“Ericsson and T-Mobile to deploy multi-band nationwide 5G network,” Ericsson (Feb. 27, 2018)
29	“GCI selects Ericsson for 5G rollout in Alaska,” Ericsson (June 18, 2019)
30	“Ericsson helps expand 5G to rural US customers,” Ericsson (Sep. 16, 2019)
31	“U.S. Cellular selects Ericsson for 5G deployments,” Ericsson (Feb. 28, 2019)
32	Ericsson FCC Slides
33	SM6701 Cover letter
34	CONFIDENTIAL Tech DI claim charts for U.S. Patent No. 9,521,616
35	CONFIDENTIAL Tech DI claim charts for U.S. Patent No. 10,797,405
36	CONFIDENTIAL Tech DI claim charts for U.S. Patent No. 9,041,074
37	CONFIDENTIAL Tech DI claim charts for U.S. Patent No. 9,736,772

Exhibits	Description
38	HTS Classifications (Chapter 8517)
39	CONFIDENTIAL Report on Ericsson StreetMacro 6701 B261, EJI Wireless Research
40	External Photos of Samsung A3LAT1K01-A10
41	CONFIDENTIAL Samsung 28GHz AU(AT1K04) Installation Manual
42	Internal Photos of Samsung A3LAT1K01-A10
43	CONFIDENTIAL Internal Photos of Samsung AT1K04-B00
44	CONFIDENTIAL Internal Photos of Samsung AT1K01
45	“Automating MIMO energy management with Machine Learning,” Ericsson (Mar. 2019)
46	“Energy Efficiency of Radio Units and its Impact on RAN Energy Consumption,” T. Berglund and H. Huynh (2017)
47	“Breaking the energy curve: An innovative approach to reducing mobile network energy use,” Ericsson (Mar. 2020)
48	“Connecting the modern urbanite with street-level solutions,” Ericsson (2019)
49	“EARTH Consortium Shows the Way to 70 Percent Energy Savings on Wireless Networks,” M. Kowalke, TMCnet (Aug. 6, 2012), available at http://blog.tmcnet.com/next-generation-communications/2012/08/earth-consortium-shows-the-way-to-70-percent-energy-savings-on-wireless-networks.html
50	“Energy Efficiency,” Ericsson.com, available at https://www.ericsson.com/en/portfolio/networks/ericsson-radio-system/radio-system-solutions/energy-efficiency
51	“Class II Permissive Change for FCC ID: TA8AKRK10101,” Ericsson (Jan. 24, 2020)
52	“Ericsson researchers exceed 4.3 Gbps downlink for 5G mm Wave,” Cabling Installation & Maintenance (Feb. 17, 2020), available at https://www.cablinginstall.com/wireless-5g/article/14168049/ericsson-researchers-exceed-43-gbps-downlink-for-5g-mmwave
53	“European companies and research organizations collaborate to halve energy consumption of 4th generation wireless networks,” Telekomkh.com (Ap. 28, 2010)
54	“Green Mobile Power & Community Power Project,” Ericsson (Nov. 23, 2010)
55	“Green Radio Technologies,” Ref. No. INFSO-ICT-247733 EARTH (Deliverable D4.2), EARTH (Jan. 30, 2012)
56	CONFIDENTIAL “DL MIMO TX Branch” Specification, Samsung
57	CONFIDENTIAL “PA Bias Control” Specification, Samsung
58	“An Energy Efficient Narrowband Internet of Things Radio Base Station,” K. Minör (June 11, 2020)
59	CONFIDENTIAL “PA Bias Control” Specification, Samsung
60	CONFIDENTIAL “Tx path On/off” Specification, Samsung
61	“An Energy Efficient Radio Base Station,” L. Prasad and O. Bjering (Aug. 18, 2018)

Exhibits	Description
62	CONFIDENTIAL RFA2810 Datasheet, Samsung
63	CONFIDENTIAL Samsung AT1K02 MRA-39 PCB Layout Excerpts
64	CONFIDENTIAL Samsung AT1K02('20.4) Specifications

APPENDICES

Appendix	Description
A	Certified copy of prosecution history of U.S. Patent No. 9,521,616
B	Certified copy of prosecution history of U.S. Patent No. 10,797,405
C	Copy of prosecution history of U.S. Patent No. 9,041,074
D	Certified copy of prosecution history of U.S. Patent No. 9,736,772
E	Patents and technical references cited in the prosecution history of U.S. Patent No. 9,521,616
F	Patents and technical references cited in the prosecution history of U.S. Patent No. 10,797,405
G	Patents and technical references cited in the prosecution history of U.S. Patent No. 9,041,074
H	Patents and technical references cited in the prosecution history of U.S. Patent No. 9,736,772

I. INTRODUCTION

1. This Complaint is filed by Samsung Electronics Co., Ltd. (“SEC”) and Samsung Electronics America, Inc. (“SEA”) (collectively, “Samsung” or “Complainants”) under Section 337 of the Tariff Act of 1930, as amended, 19 U.S.C. § 1337, based on the unlawful importation into the United States, the sale for importation into the United States, and the sale within the United States after importation, by the proposed Respondents of certain wireless communications equipment, and components thereof that infringe the following claims of U.S. Patent Nos. 9,521,616; 10,797,405; 9,041,074; and 9,736,772 (collectively, the “Asserted Patents”) either literally or under the doctrine of equivalents (independent claims in bold):

Patent Number	Asserted Claims
9,521,616	1 , 2–5, 8–10, 11 , 12–16, 19–21, 22 , 23–24, 26, 29–31, 32 , 33–37, 40, 42
10,797,405	1 , 2–10, 11 , 12–20
9,041,074	1 –6, 11–15, 16 , 17
9,736,772	1 , 2–7, 8 , 9–15

2. SEC and its subsidiaries, including SEA, are world leaders in electronics, specializing in wireless communications, digital appliances and media, semiconductors, memory, and system integration. Today, Samsung’s innovative wireless communications business is world recognized, and includes wireless communications devices ranging from smartphones to tablets as well as hardware and software that support the networks to which those devices connect.

3. The proposed Respondents Ericsson AB, Telefonaktiebolaget LM Ericsson, and Ericsson Inc. (collectively, “Ericsson” or “Respondents”) manufacture, import, sell for importation, sell after importation, service, and repair, among other things, wireless communications equipment and components thereof, such as wireless communication base

stations (collectively, the “Accused Products”). The Accused Products incorporate, without license, many technologies developed by Samsung and protected by patents issued to and owned by SEC.

4. Certified copies of the Asserted Patents are included at Exhibits 1–4.¹ A list of foreign counterparts to the Asserted Patents is included at Exhibit 9. SEC owns all rights, title, and interest in each of the Asserted Patents. Copies of the assignment records for each of the Asserted Patents are included at Exhibits 5–8.²

5. A domestic industry as required by 19 U.S.C. §§ 1337(a)(2) and (3) exists and/or is in the process of being established in the United States relating to the technology protected by the Asserted Patents, including substantial investment and expenditures of SEA and its partners, and substantial investment in the exploitation of the inventions claimed in the Asserted Patents, including through engineering, research and development, and servicing.

6. Samsung seeks as relief a permanent limited exclusion order under 19 U.S.C. § 1337(d) barring from entry into the United States directly infringing or indirectly infringing wireless communications equipment and components thereof manufactured or sold by or on behalf of Respondents. Samsung further seeks as relief a permanent cease and desist order under 19 U.S.C. § 1337(f) prohibiting Respondents from marketing, distributing, selling, offering for sale, warehousing inventory for distribution, or otherwise transferring or bringing into the United States infringing wireless communications equipment and components thereof.

¹ Respondents have ordered certified copies of the ’074 patent and its file history, and will supplement the complaint with those documents once they arrive.

² Respondents have ordered certified copies of the assignment records for the ’616, ’405, and ’772 patents, and will supplement the complaint with those documents once they arrive.

II. COMPLAINANTS

7. Complainant Samsung Electronics Co., Ltd. (“SEC”) is a corporation organized and existing under the laws of the country of Korea, having its principal place of business at 129 Samsung ro, Maetan-dong, Yeongtong-gu Suwon-si, Gyeonggi-do 16677 Korea. SEC is the assignee of the Samsung patents with the right to sue for all past, present, and future infringement thereof.

8. Complainant Samsung Electronics America, Inc. (“SEA”) is a corporation organized and existing under the laws of the state of New York, having its principal place at 85 Challenger Rd., Ridgefield Park, New Jersey 07660. SEA is a wholly owned subsidiary of SEC.

9. Samsung is one of the world’s leading electronics companies, specializing in wireless communications, digital appliances and media, semiconductors, memory, and system integration. Founded in 1969, SEC has grown to become a world leader in the design, manufacture, and marketing of a wide variety of electronic products. SEC is one of the largest manufacturers of wireless communications devices and cellular network equipment in the world and has long focused on the United States as a critical market for its products. SEC established SEA to engage in activities in the United States related to certain of Samsung’s product lines.

10. SEC and its subsidiaries, including SEA, have one of the largest Research and Development budgets globally and have been instrumental in making 5G a commercial reality by helping launch some of the first networks. Samsung’s investments in innovative and top-quality products and processes include significant investments in the field of wireless communications. Samsung’s industry advancements include cutting-edge wireless communication devices like smart phones and tablets, as well as the hardware and software

that builds the networks to which those devices connect, including wireless base stations using 5G cellular standards. Additional information concerning Samsung can be obtained from its 2019 Annual Report at Exhibit 18.

11. In the United States, SEA has been involved with numerous activities relating to the commercialization, engineering, research and development, testing, customer service, importation, sales, marketing, and distribution of wireless communication devices, including base stations and mobile devices (including smartphones, tablets, smartwatches, and mobile accessories) that communicate using the cellular standards, including 5G. In the last two years, SEA has provided thousands of 5G base stations to U.S. carriers including Verizon, Sprint/T-Mobile, and AT&T, and has provided tens of millions of mobile devices in the United States. SEA has also invested and continues to invest significantly in the United States in, among other things, mobile research and development.

III. PROPOSED RESPONDENTS

12. On information and belief, Ericsson AB is a corporation organized and existing under the laws of the Kingdom of Sweden, having its principal place of business at Torshamnsgatan 23, Kista, Stockholm, Sweden. On information and belief, Ericsson AB is involved in the manufacturing, development, sale for importation, and/or importation into the United States of the Accused Products.

13. On information and belief, Telefonaktiebolaget LM Ericsson is a corporation organized and existing under the laws of the Kingdom of Sweden, having its principal place of business at Torshamnsgatan 21, Kista, Stockholm, Sweden 164 83. On information and belief, Telefonaktiebolaget LM Ericsson manufactures, develops, sells for importation, and imports into the United States the Accused Products.

14. On information and belief, Ericsson Inc. is a corporation organized and existing

under the laws of the State of Delaware, having its principal place of business at 6300 Legacy Drive, Plano, Texas 75024. On information and belief, Ericsson Inc. imports into the United States the Accused Products. Additionally, on information and belief, Ericsson Inc. is a wholly owned subsidiary of Telefonaktiebolaget LM Ericsson.

IV. THE TECHNOLOGY AND PRODUCTS AT ISSUE

15. The technologies at issue relate to wireless communications base station equipment for use with 4G and 5G applications and including certain antenna units, radio units, digital units, CPU units, modem units, power amplifiers, and/or related software as components. The base station equipment is used by wireless carriers in the United States to build wireless networks.

16. Pursuant to Commission Rule 210.12(a)(12), the Accused Products are wireless communications devices or software for use with 4G and 5G applications and components thereof, specifically base stations, base band units, antenna units, antenna systems, radio units, radio systems, mobile transport systems, site systems, digital units, CPU units, modem units, central units, power amplifiers, or related software; radio access network software; network management software; cloud radio access networks; virtual radio access networks; or radio access processing platforms. The Accused Products are sold for importation into, imported into, sold after importation into, and used within the United States by or on behalf of Respondents.

V. THE ASSERTED PATENTS AND A NONTECHNICAL DESCRIPTION OF THE INVENTIONS

17. SEC owns by assignment the full right, title and interest in U.S. Patent Nos. 9,521,616; 10,797,405; 9,041,074; and 9,736,772 (the “Asserted Patents”). *See* Exhibits 1–8. Pursuant to Commission Rule 210.12(c), one certified copy of the prosecution histories of

each of the Asserted Patents plus three additional copies of the prosecution histories have been submitted with this complaint as Appendices A–D. Pursuant to Commission Rule 210.12(c)(2), four copies of each Asserted Patent and the applicable pages of each technical reference mentioned in the prosecution history of each Asserted Patent have been submitted with this complaint as Appendices A–H. Samsung has not declared the Asserted Patents as potentially essential to any standard maintained by a standard setting organization.

A. The '616 Patent³

18. United States Patent No. 9,521,616, entitled “Apparatus and Method for Reducing Power Consumption in Multi Antenna System,” issued on December 13, 2016, to inventors Byung-Ki Kim and Mi-Yeon Yu. The '616 patent issued from U.S. Patent App. Ser. No. 14/507,194, filed on October 6, 2014. The '616 patent claims priority to Korean Patent App. No. 10-2009-0092203, filed on September 29, 2009. The '616 patent expires on September 28, 2030.

19. The '616 patent contains 42 claims, including 4 independent claims and 38 dependent claims. Complainants assert that Respondents’ wireless communications equipment and activities relating thereto that contain a radio frequency unit with a power saving mode infringe claims 1–5, 8–16, 19–24, 26, 29–37, 40, and 42 of the '616 patent.

20. The '616 patent generally concerns reducing power consumption in a base station that uses a multi-antenna system. The '616 patent describes a base station that is configured to disable the power amplifier for one of the antennas in a multi-antenna radio frequency unit when traffic load is low. The traffic load can be calculated, for example, by

³ These descriptions and any other non-technical descriptions within this Complaint are for illustrative purposes only. Nothing contained within this Complaint is intended to, either implicitly or explicitly, express any position regarding the proper construction of any claim of the Asserted Patents.

measuring the proportion of Resource Blocks (RB) used by the base station compared to the total number of RBs available for use. In that non-limiting embodiment, a power amplifier is disabled when the percentage of RBs used falls under a threshold amount.

B. The '405 Patent

21. United States Patent No. 10,797,405, entitled “Module Comprising Antenna and RF Element, and Base Station Including Same,” issued on October 6, 2020, to inventors Kwanghyun Baek, Seungtae Ko, Kijoon Kim, Juho Son, Sangho Lee, Youngju Lee, Jungyub Lee, Yonghun Cheon, and Dohyuk Ha. The '405 patent issued from U.S. Patent App. Ser. No. 16/906,476, filed on June 19, 2020. The '405 patent claims priority to Korean Patent App. No. 10-2017-0175064, filed on December 19, 2017. The '405 patent expires on December 19, 2028.

22. The '405 patent contains 20 claims, including 2 independent claims and 18 dependent claims. Complainants assert that Respondents' wireless communications equipment and activities relating thereto that contain 5G-capable and 5G-ready antennas and radio frequency integrated circuits infringe claims 1–20 of the '405 patent.

23. The '405 patent generally relates to the design of a 5G capable antenna that supports higher data rates than previous generations. The '405 patent describes “miniaturizing an antenna module by minimizing the use of a substrate while improving circuit stability of an antenna module.” '405 patent at 2:22–37. In one example embodiment, the '405 patent discloses forming antennas on one surface of a first printed circuit board (PCB) and placing a plurality of second PCBs on the other surface of the first PCB. The second PCBs can be electrically connected to the first PCB through a grid array. The second PCBs may include a radio frequency integrated circuit (RFIC) chip.

C. The '074 Patent

24. United States Patent No. 9,041,074, entitled “Multilayered Circuit Type Antenna Package,” issued on May 26, 2016, to inventors Won-bin Hong, Alexander Goudelev, Kwang-hyun Baek, and Young-hwan Kim. The '074 patent issued from U.S. Patent App. Ser. No. 13/531,120, filed on June 22, 2012. The '074 patent claims priority to Korean Patent App. No. 10-2011-0107059, filed on October 19, 2011. The '074 patent expires on June 22, 2032.

25. The '074 patent contains 18 claims, including 2 independent claims and 16 dependent claims. Complainants assert that Respondents’ wireless communications equipment and activities relating thereto that contain a multilayered 5G-capable and 5G-ready antenna package infringe claims 1–6, 11–17 of the '074 patent.

26. The '074 patent generally concerns a multilayered antenna package for millimeter band communication that allows for lower manufacturing costs than prior techniques. The '074 patent describes an antenna structure “in which the number of stacked layers are minimized.” '074 patent at 1:59–61. In one embodiment, a multilayered antenna package includes a “radio frequency integrated circuit (RFIC) interface layer” that is configured to transmit a radio frequency (RF) signal, a coplanar waveguide layer placed above and configured to receive the RF signal transmitted by the RFIC interface layer, “an antenna portion” above and configured to “irradiate a signal that is transmitted from the coplanar waveguide layer,” and dielectric layers disposed between the RFIC interface layer, coplanar waveguide layer, and antenna portion. *Id.*, 1:62–2:6.

D. The '772 Patent

27. United States Patent No. 9,736,772, entitled “Method and Apparatus for Controlling Power at Base Station in a Communication System,” issued on August 15, 2017,

to inventor Suk-Kyun Hur. The '772 patent issued from U.S. Patent App. Ser. No. 15/357,364 filed on November 21, 2016. The '772 patent claims priority to Korean Patent App. No. 10-2009-0124935. The '772 patent expires on December 15, 2030.

28. The '772 patent contains 15 claims, including 2 independent claims and 13 dependent claims. Complainants assert that Respondents' wireless communications equipment and activities relating thereto that contain a power controlled component that is adjusted in response to traffic variation infringe claims 1–15 of the '772 patent.

29. The '772 patent generally relates to reducing a base station's power consumption by reducing the operation voltage of a power amplifier based on the traffic load on the base station. The operational voltage can be compared to a reference voltage that is set based on the traffic variation in the base station, and a controller adjusts the operation voltage based on the result of the comparisons. In a non-limiting example, the reference voltage is lowered during periods of low traffic, and if the operational voltage is above the adjusted reference voltage, then the operation voltage is reduced.

E. Foreign Counterparts

30. A list of foreign counterpart patents and applications to the Asserted Patents is included with this Complaint as Exhibit 9. SEC owns all right, title, and interest in each of these foreign counterparts. Complainants are aware of no other foreign counterparts or foreign counterpart applications corresponding to the Asserted Patents that have been issued, abandoned, or rejected.

F. Licensees

31. Confidential Exhibit 10 includes a list of entities with licenses or other rights to the Asserted Patents. Respondents were licensees of the Asserted Patents until December 31, 2020, but, on information and belief, after expiration of the license Respondents have

continued to sell Accused Products for importation into the United States, import Accused Products into the United States, and/or sell Accused Products within the United States after importation

VI. RESPONDENTS' UNLAWFUL AND UNFAIR ACTS

32. Respondents have engaged in unlawful and unfair acts after expiration of a license to the Asserted Patents, including the sale for importation into the United States, importation into the United States, and/or sale within the United States after importation of the Accused Products that infringe one or more of the following claims of the Asserted Patents (independent claims in bold):

Patent Number	Asserted Claims
'616 Patent	1 , 2-5, 8-10, 11 , 12-16, 19-21, 22 , 23-24, 26, 29-31, 32 , 33-37, 40, 42
'405 Patent	1 , 2-10, 11 , 12-20
'074 Patent	1 -6, 11-15, 16 , 17
'772 Patent	1 , 2-7, 8 , 9-15

A. Infringement of the '616 Patent

33. On information and belief, Respondents import, sell for importation, and/or sell after importation into the United States the Accused Products that infringe the '616 patent.

34. On information and belief, the Accused Products infringe at least claims 1-5, 8-16, 19-24, 26, 29-37, 40, and 42 of the '616 patent. On information and belief, Respondents directly infringe at least claims 1-5, 8-16, 19-24, 26, 29-37, 40, and 42 of the '616 patent by making, using, selling, offering for sale within the United States and/or importing into the United States the Accused Products that contain a radio frequency unit with a power saving mode.

35. On information and belief, Respondents actively induce others, including network service providers who deploy the Accused Products in their networks, to commit

direct infringement of at least claims 1–5, 8–16, 19–24, 26, 29–37, 40, and 42 of the '616 patent. On information and belief, service providers who deploy the Accused Products in their networks and make routine use of the Accused Products directly infringe at least claims 1–5, 8–16, 19–24, 26, 29–37, 40, and 42 of the '616 patent. On information and belief, Respondents have been aware of the '616 patent or have acted with willful blindness to its existence at least through the parties' licensing negotiations. Alternatively, Respondents have knowledge of the '616 patent and the Accused Products' infringement thereof since at least the time they were served with this Complaint.

36. On information and belief, Respondents contribute to others' infringement of at least claims 1–5, 8–16, 19–24, 26, 29–37, 40, and 42 of the '616 patent, including infringement by network service providers who deploy the Accused Products in their networks by providing the Accused Products or components thereof, which are specially made or adapted for use in an infringement of these claims and are not staple articles of commerce suitable for substantial non-infringing use. Respondents had knowledge or acted with willful blindness that the Accused Products or components thereof were specially made or adapted for use in an infringement of the '616 patent and not a staple article of commerce suitable for substantial non-infringing use.

37. Exemplary claim charts comparing the '616 patent's independent asserted claims 1, 11, 22, and 32 to Respondents' base station products are attached as Exhibit 11. Copies of documents cited in the claim charts are attached at Exhibit 19.

B. Infringement of the '405 Patent

38. On information and belief, Respondents import, sell for importation, and/or sell after importation into the United States the Accused Products that infringe the '405 patent.

39. On information and belief, the Accused Products infringe at least claims 1–20 of the '405 patent. On information and belief, Respondents directly infringe claims 1–20 of the '405 patent by making, using, selling, offering for sale within the United States and/or importing into the United States the Accused Products that contain 5G-capable and 5G-ready antennas and radio frequency integrated circuits.

40. On information and belief, Respondents actively induce others, including network service providers who deploy the Accused Products in their networks, to commit direct infringement of claims 1–20 of the '405 patent. On information and belief, service providers who deploy the Accused Product in their networks and make routine use of the Accused Products directly infringe claims 1–20 of the '405 patent. On information and belief, Respondents have been aware of the '405 patent or have acted with willful blindness to its existence at least through the parties' licensing negotiations. Alternatively, Respondents have knowledge of the '405 patent and the Accused Products' infringement thereof since at least the time they were served with this Complaint.

41. On information and belief, Respondents contribute to others' infringement of claims 1–20 of the '405 patent, including infringement by network service providers who deploy the Accused Products in their networks by providing the Accused Products or components thereof, which are specially made or adapted for use in an infringement of these claims and are not staple articles of commerce suitable for substantial non-infringing use. Respondents had knowledge or acted with willful blindness that the Accused Products or components thereof were specially made or adapted for use in an infringement of the '405 patent and not a staple article of commerce suitable for substantial non-infringing use.

42. Exemplary claim charts comparing the '405 patent's independent asserted claims 1 and 11 to Respondents' base station products are attached as Exhibit 12. Copies of documents cited in the claim charts are attached at Exhibit 20.

C. Infringement of the '074 Patent

43. On information and belief, Respondents import, sell for importation, and/or sell after importation into the United States the Accused Products that infringe the '074 patent.

44. On information and belief, the Accused Products infringe at least claims 1–6, 11–17 of the '074 patent. On information and belief, Respondents directly infringe at least claims 1–6, 11–17 of the '074 patent by making, using, selling, offering for sale within the United States and/or importing into the United States the Accused Products that contain a multilayered 5G-capable and 5G-ready antenna package.

45. On information and belief, Respondents actively induce others, including network service providers who deploy the Accused Products in their networks, to commit direct infringement of at least claims 1–6, 11–17 of the '074 patent. On information and belief, service providers who deploy the Accused Products in their networks and make routine use of the Accused Products directly infringe at least claims 1–6, 11–17 of the '074 patent. On information and belief, Respondents have been aware of the '074 patent or have acted with willful blindness to its existence at least through the parties' licensing negotiations. Alternatively, Respondents have knowledge of the '074 patent and the Accused Products' infringement thereof since at least the time they were served with this Complaint.

46. On information and belief, Respondents contribute to others' infringement of at least claims 1–6, 11–17 of the '074 patent, including infringement by network service providers who deploy the Accused Products in their networks by providing the Accused Products or components thereof, which are specially made or adapted for use in an

infringement of these claims and are not staple articles of commerce suitable for substantial non-infringing use. Respondents had knowledge or acted with willful blindness that the Accused Products or components thereof were specially made or adapted for use in an infringement of the '074 patent and not a staple article of commerce suitable for substantial non-infringing use.

47. Exemplary claim charts comparing the '074 patent's independent asserted claims 1 and 16 to Respondents' base station products are attached as Exhibit 13. Copies of documents cited in the claim charts are attached at Exhibit 21.

D. Infringement of the '772 Patent

48. On information and belief, Respondents import, sell for importation, and/or sell after importation into the United States the Accused Products that infringe the '772 patent.

49. On information and belief, the Accused Products infringe claims 1–15 of the '772 patent. On information and belief, Respondents directly infringe claims 1–15 of the '772 patent by making, using, selling, offering for sale within the United States and/or importing into the United States the Accused Products that contain a power controlled component that is adjusted in response to traffic variation.

50. On information and belief, Respondents actively induce others, including network service providers who deploy the Accused Products in their networks, to commit direct infringement of claims 1–15 of the '772 patent. On information and belief, service providers who deploy the Accused Products in their networks and make routine use of the Accused Products directly infringe claims 1–15 of the '772 patent. On information and belief, Respondents have been aware of the '772 patent or have acted with willful blindness to its existence at least through the parties' licensing negotiations. Alternatively, Respondents have

knowledge of the '772 patent and the Accused Products' infringement thereof since at least the time they were served with this Complaint.

51. On information and belief, Respondents contribute to others' infringement of claims 1–15 of the '772 patent, including infringement by network service providers who deploy the Accused Products in their networks by providing the Accused Products or components thereof, which are specially made or adapted for use in an infringement of these claims and are not staple articles of commerce suitable for substantial non-infringing use. Respondents had knowledge or acted with willful blindness that the Accused Products or components thereof were specially made or adapted for use in an infringement of the '772 patent and not a staple article of commerce suitable for substantial non-infringing use.

52. Exemplary claim charts comparing the '772 patent's independent asserted claims 1 and 8 to Respondents' base station products are attached as Exhibit 14. Copies of documents cited in the claim charts are attached at Exhibit 22.

VII. SPECIFIC INSTANCES OF UNFAIR IMPORTATION

53. On information and belief, Respondents, either themselves or through subsidiaries or third parties acting on behalf of Respondents, are engaged in the manufacture, importation, sale for importation, offer for sale after importation, sale and/or use after importation into the United States of infringing wireless communications equipment and components thereof. On information and belief, the Accused Products are manufactured abroad and imported for sale into the United States. Respondents have recently admitted to “importing and selling network infrastructure equipment to cellular carriers in the United States.” *Ericsson Inc., et al. v. Samsung Electronics Co. Ltd., et al.*, No. 2:20-cv-380, Complaint ¶ 20 (Dec. 11, 2020). Exhibit 16. On information and belief, this “network infrastructure equipment” includes the Accused Products.

54. On information and belief, Ericsson has signed contracts with cellular service providers in the United States to install base station equipment for 5G networks in the past, present, and future. *See, e.g.*, Exhibits 23–33. In Ericsson’s 2019 Annual Report, the company stated “Ericsson led the way in 2019, deploying 54 live 5G networks in 44 unique markets across all major operators in the US.” Exhibit 23 (Annual Report) at 25. Ericsson’s website lists the company’s current public contracts with 5G providers in the United States, including AT&T, Verizon, Sprint, T-Mobile, GCI, Rural Independent Network Alliance (RINA) Wireless, US Cellular, and Nex-Tech Wireless. *See* Exhibit 24 (“Publicly Announced 5G Contracts”). On information and belief, Ericsson’s Accused Products have been and are being continuously sold for importation, imported into the United States, and sold after importation for use in engineering, testing, and constructing 5G networks, or portions thereof, under these contracts. *See, e.g.*, Exhibit 25 (“The First Wireless 5G Data Transfer Over Millimeter Wave _ AT&T”); Exhibit 26 (“Verizon awards 5G contract to Ericsson”); Exhibit 27 (“Ericsson leads Sprint’s commercial mobile 5G launch”); Exhibit 28 (“Ericsson and T-Mobile to deploy multi-band nationwide 5G network”); Exhibit 29 (“GCI selects Ericsson for 5G rollout in Alaska”); Exhibit 30 (“Ericsson helps expand 5G to rural US customers”); Exhibit 31 (“U.S. Cellular selects Ericsson for 5G deployments”); Exhibit 32 (Ericsson FCC slides) at slide 5. On information and belief, these sales and importations are continuing after expiration of Ericsson’s license to the Asserted Patents.

55. On information and belief, Ericsson’s sales and importations into the United States include its Street Macro 6701 base stations. In 2019, Ericsson applied for FCC certification for its Street Macro radio, a base station radio used in 5G networks. Exhibit 33 (“SM6701 Cover letter”). Recent PIERS database records identify importation by Ericsson

of base stations into the United States. *See* Exhibit 15 (PIERS Database Report). On information and belief, these sales and importations of the Street Marco 6701 base stations have continued after expiration of Ericsson’s license to the Asserted Patents.

VIII. CLASSIFICATION OF THE INFRINGING PRODUCTS UNDER THE HARMONIZED TARIFF SCHEDULE

56. On information and belief, the Accused Products fall within at least the classifications of the Harmonized Tariff Schedule (“HTS”) of the United States attached at Exhibit 38 (HTS Classifications 8517.11.00, 8517.62.00, and 8517.70.00, including base stations, semiconductors, and processors, respectively). The identified HTS numbers are intended to be for illustration only and are not exhaustive of the products accused of infringement in this Complaint. The HTS numbers are not intended to limit the scope of the Investigation.

IX. RELATED LITIGATION

57. Ericsson filed an action in the United States District Court for the Eastern District of Texas seeking, among other things, “specific performance requiring Samsung make available to Ericsson a license to all of its Essential Patents on FRAND terms” and asserting certain patents against Samsung which Ericsson has declared are standard essential. *See* Case No. 2:20-cv-00380-JRG at Document 17 (January 1, 2021). Samsung contends that it has been willing to enter into a FRAND license, but Ericsson has failed to accept FRAND terms and has breached its own FRAND obligations to Samsung.

58. Ericsson filed subsequent actions in the United States District Court for the Eastern District of Texas asserting claims of additional patents against Samsung, and in the ITC alleging violations of Section 337 based on the same patents, which on information and belief were not declared as standard essential by Ericsson. *See* Case No. 2:21-cv-00001 at

Document 1 (January 1, 2021); Inv. No. 337-TA-3520, Compl. (Jan. 4, 2021). Complainants have simultaneously filed a counterclaim in the Eastern District of Texas action accusing Ericsson of infringement of the Asserted Patents. The Asserted Patents have not been the subject of any other current or prior litigation.

X. THE DOMESTIC INDUSTRY

59. A domestic industry in the United States exists with respect to articles protected by the '405, '616, and '772 patents based upon SEA's significant investments in plant and equipment and significant employment of labor and capital in the United States.

60. A domestic industry is in the process of being established with respect to articles protected by the '074 patent based on SEA's active engagement of tangible steps toward exploitation of the '074 patent and the likelihood that an industry will be established in the future.

A. Articles that Practice the Asserted Patents (Technical Prong)

61. Certain Samsung 4G and/or 5G base station equipment ("Domestic Industry Products") practice at least one claim of the Asserted Patents.

62. Certain Samsung base station equipment for use with 4G and/or 5G applications, including, for example, the Samsung AT1K01, AT1K04, HT5H01, RRH-P4A, MTP02P-41A, CDU30, LMD1, LCC4, GMA1, GCB1, GCA1, GMA0, RF4402d-D1A, RFD01F-26A, RFV01U-D1A, RFV01U-D2A, RRH-P4(MRRH19), RT2201RU, and RT4401-48A practice at least one claim of the '616 patent. An exemplary claim chart comparing the Samsung AT1K04 to a representative claim of the '616 patent is attached as Exhibit 34. Complete copies of documents referenced in the claim chart are attached in Exhibits 39–68.

63. Certain Samsung mmWave base station equipment, including, for example, the Samsung AT1K01, AT1K04, and HT5H01 products, practices at least one claim of the '405 patent. An exemplary claim chart comparing the Samsung AT1K01 and AT1K04 to a representative claim of the '405 patent is attached as Exhibit 35. Complete copies of documents referenced in the claim chart are attached in Exhibits 39–68.

64. Certain Samsung base station equipment for use with 4G and 5G (Frequency Range 1) applications, including, for example, the Samsung RRH-P4A, MTP02P-41A, CDU30, LMD1, LCC4, GMA1, GCB1, GCA1, GMA0, RF4402d-D1A, RFD01F-26A, RFV01U-D1A, RFV01U-D2A, RRH-P4(MRRH19), and RT4401-48A practices at least one claim of the '772 patent. An exemplary claim chart comparing the Samsung 4G CDU30 (LMD1+LCC4) and RFV01U-D2A to a representative claim of the '772 patent is attached as Exhibit 37. Complete copies of documents referenced in the claim chart are attached in Exhibits 39–68.

65. The Domestic Industry Products practice more claims than the claims charted in Exhibits 34–37, and Complainants may demonstrate satisfaction of the technical prong through other claims of the Asserted Patents.

B. United States Economic Activities Relating to the Domestic Industry Products (Economic Prong)

66. Samsung has an existing domestic industry in the '616, '405, and '772 patents. SEA has made and continues to make significant investments in plant and equipment and significant employment of labor and capital relating to its base station equipment. As described in the confidential declaration of Alok Shah, SEA employs hundreds of direct employees and contractors, and invests hundreds of millions of dollars, to perform all of the steps required to install, support, and maintain its base stations. Confidential Exhibit 17 (Shah

Decl.). SEA not only delivers the hardware components for its base stations—including the Domestic Industry Products—but performs numerous additional steps to implement and service the base stations. These activities include network planning, installation, integration and commissioning, field testing, optimization, and software-related services. Confidential Exhibit 17 (Shah Decl.) at ¶ 4.

C. Domestic Industry in the Process of Being Established

67. SEA is actively engaged in the steps leading to the establishment of a domestic industry relating to base station equipment that will practice the '074 patent, and there is a significant likelihood that a domestic industry will be established in the future.

68. SEA will install and support Samsung mmWave base station equipment, including the Samsung AT1K02 and AT1K06, which will practice at least one claim of the '074 patent. An exemplary claim chart comparing the Samsung AT1K02 to a representative claim of the '074 patent is attached as Exhibit 36. Complete copies of documents referenced in the claim chart are attached in Exhibits 39–68.

69. SEA is making and will make significant investments in base station equipment that will practice the '074 patent, including for network planning, installation, integration and commissioning, field testing, optimization, and software-related services. Confidential Exhibit 17 (Shah Decl.) at ¶ 9. For example, SEA has agreements in place with current customers, and is pursuing agreements with additional customers, to install base station equipment that will practice the '074 patent, and is committed to installing this equipment in the United States starting in January 2021. Confidential Exhibit 17 (Shah Decl.) at ¶ 8.

XI. RELIEF REQUESTED

70. Complainants respectfully request that the Commission:

(a) Institute an investigation pursuant to Section 337 of the Tariff Act of 1930, as amended, 19 U.S.C. § 1337, with respect to Proposed Respondents' violations of that section arising from the importation into the United States, sale for importation, and/or the sale within the United States after importation of certain wireless communications equipment, articles containing same, and components thereof made on behalf of Respondents, that infringe one or more claims of the Asserted Patents;

(b) Schedule and conduct a hearing pursuant to Section 337(c) for the purposes of (i) receiving evidence and hearing argument concerning whether there has been a violation of Section 337, and (ii) following the hearing, determining that there has been a violation of Section 337;

(c) Issue a permanent limited exclusion order directed to products manufactured by Respondents, their subsidiaries, related companies and agents pursuant to 19 U.S.C. § 1337(d) excluding entry into the United States of certain certain wireless communications equipment, articles containing same, and components thereof made by or on behalf of Respondents, that infringe one or more claims of the Asserted Patents;

(d) Issue a permanent cease and desist order pursuant to 19 U.S.C. § 1337(f) prohibiting Respondents, their subsidiaries, related companies and agents from conducting any of the following activities in the United States: importing, selling, marketing, advertising, distributing, offering for sale, transferring (except for exportation), soliciting United States agents or distributors, or aiding and abetting other entities in the importation, sale for importation, sale after importation, transfer (except for exportation), or distribution of certain certain wireless communications equipment, articles containing same, and components

thereof made by or on behalf of Respondents, that infringe one or more claims of the Asserted Patents;

(e) Impose a bond upon importation of certain certain wireless communications equipment, articles containing same, and components thereof made by or on behalf of Respondents, that infringe one or more claims of the Asserted Patents during the 60-day review period pursuant to 19 U.S.C. § 1337(j); and

(f) Issue other and further relief as the Commission deems just and proper under the law, based on the facts determined by the investigation and the authority of the Commission.

Dated: January 7, 2021

Respectfully submitted,



Paul F. Brinkman, P.C.
Edward C. Donovan, P.C.
F. Christopher Mizzo, P.C.
KIRKLAND & ELLIS LLP
1301 Pennsylvania Ave, N.W.
Washington, D.C. 20004
Telephone: (202) 389-5000
Facsimile: (202) 389-5200
paul.brinkman@kirkland.com

Gregory A. Arovas, P.C.
Todd M. Friedman, P.C.
KIRKLAND & ELLIS LLP
601 Lexington Avenue
New York, N.Y. 10022
Telephone: (212) 446-4800
Facsimile: (212) 446-4900

Kevin Hardy
QUINN EMANUEL
URQUHART & SULLIVAN, LLP
1300 I Street N.W.
Suite 900
Washington, D.C. 20005
Telephone: (202) 538-8000
Facsimile: (202) 538-8100
kevinhardy@quinnemanuel.com

Thomas D. Pease
QUINN EMANUEL
URQUHART & SULLIVAN, LLP
51 Madison Ave., 22nd Floor
New York, NY 10010
Telephone: (212) 849-7000
Facsimile: (212) 849-7100

Paul Zeineddin
AXINN, VELTROP & HARKRIDER LLP
950 F. Street, N.W.
Washington, DC 20004
Telephone: (202) 912-4700
Facsimile: (202) 912-4701
pzeineddin@axinn.com

Counsel for Complainants

UNITED STATES INTERNATIONAL TRADE COMMISSION
WASHINGTON, D.C.

In the Matter of

CERTAIN WIRELESS COMMUNICATIONS
EQUIPMENT AND COMPONENTS
THEREOF

Investigation No. 337-TA-____

VERIFICATION OF COMPLAINT

I, Young Ho Kim, am Principal Engineer for Samsung Electronics Co., Ltd., and am duly authorized to verify this complaint on behalf of Samsung Electronics Co., Ltd and Samsung Electronics America, Inc. I have read the complaint and am aware of its contents. To the best of my knowledge, information, and belief, and based upon a reasonable inquiry under the circumstances, I hereby certify that:

1. The allegations contained in the complaint are well grounded in fact and have evidentiary support, or are likely to have evidentiary support after a reasonable opportunity for further investigation or discovery;
2. The claims and other legal contentions set forth in the complaint are warranted by existing law or by a good faith, non-frivolous argument for extension, modification, or reversal of existing law, or by the establishment of new law; and
3. The complaint is not being filed for any improper purpose, such as to harass or to cause unnecessary delay or needless increase in the cost of litigation.

Dated: January 5, 2021



Young Ho Kim